Incoming
M/045/0078
cc: Leslie, Tom

State of Utah
GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

August 11, 2010

Mr. Oren Gatten
North American Exploration, Inc.
447 North 300 West, Suite 3
Kaysville, UT 84037-4203

Dear Mr. Gatten:

Subject: Completeness Review Comments and Request for Information
Ground Water Discharge Permit Application, Kiewit Project

The Division of Water Quality (DWQ) has completed a review of the June 4. 2010 ground water discharge permit application prepared by North American Exploration for the Kiewit Project. Based on your application, a cyanide heap leach pad will be constructed to process gold from ore mined from the following three locations in Tooele County, Utah: Section 19, Township 8 South, Range 17 West and Sections 24 and 25, Township 8 South, Range 18 West. Our comments regarding the permit application are provided below.

Issue 1: Compliance Monitoring Wells

It is our understanding that Desert Hawk Gold Corporation will construct a double liner design with leak detection for the Kiewit leach pad and processing area similar to the Cactus Mill. With this best available technology (BAT) design, the leak detection system will serve as the primary compliance monitoring system and ground water quality monitoring will serve as a secondary or backup compliance monitoring system in the event of a BAT failure.

The application proposes to drill two downgradient monitor wells, one to a depth of approximately 40 feet and another to the alluvium/bedrock contact underneath the wash where the leach pad will be located. However, at this time there is no information on ground water conditions at the site. Exploratory drill holes nearby have encountered ground water between 350 and 400 feet below ground surface. It is possible that ground water under the leach pad site may also be very deep, in which case ground water monitoring would not provide an early warning that leach fluids are leaking through the liner system and being released into the subsurface. As mentioned above, ground water monitoring will serve as the secondary compliance monitoring system for the heap leach facility. Site conditions, which are unknown at this point, will affect permit requirements for ground water monitoring. Because of the uncertainty of the depth to ground water, DWQ proposes that Desert Hawk drill one downgradient monitoring well to determine the depth and quality of the uppermost ground water. In accordance with UAC R317-6-6.9(A), the well should be located as close to the downgradient toe of the leach pad as practicable.

The well should be screened within the upper 10 feet of the ground water static level and should be constructed in accordance with UAC R317-6-6.3(I)6. If ground water is not encountered in the alluvium, the well should be drilled to the alluvium/ bedrock contact and screened just above the bedrock. In this case, the presence of water with chemical components of the leach fluids in the well would be cause for noncompliance with permit conditions.

To enable depth to water measurements to be converted to ground water elevations, a permanent measuring point must be marked and surveyed for each monitoring well. In addition to the measuring point, each well must be surveyed for x, y, and z coordinates for mapping purposes. This information, along with the top and bottom of the well's screened interval, should be reported to DWQ as part of the permit application.

Issue 2: Ground Water Monitoring

If ground water is encountered above the bedrock, periodic sampling and analysis will be used for compliance monitoring in the permit. Monitoring parameters will be those associated with cyanide heap leaching, which include field pH and laboratory analysis of total cyanide, total dissolved solids, nitrate + nitrite as N, major ions (Na, K, Mg, Ca, Cl, SO_4) and alkalinity. Field monitoring parameters will include ground water elevation, pH, temperature, and specific conductance.

After monitoring well development has been completed, an accelerated background monitoring program must be initiated to characterize background ground water quality to establish ground water protection levels. To define the natural variability of the monitoring parameters, at least eight samples will be taken from the well over a one-year period but not more frequent than a monthly schedule. Mean concentrations and standard deviations from these data will be used with the provisions of UAC R317-6-4 to establish ground water protection levels for the well(s). The permit will be issued with preliminary protection levels based on available data until the accelerated background monitoring program has been completed. After the accelerated background monitoring program has been completed, compliance monitoring will be required on a quarterly schedule. At least one sample should be taken from the downgradient well(s) and analyzed for these parameters before any leaching is done at the site.

Issue 3: Ground Water Sampling, Analysis and Quality Assurance Plan

Ground water sampling must be done according to a Sampling, Analysis, and Quality Assurance Plan approved by the Executive Secretary. The Plan must meet the requirements of UAC R317-6-6.3(I) and UAC R317-6-6.3(L). Methods for sampling, quality assurance/quality control, and laboratory analytical methods should be listed in the Plan and followed consistently. In accordance with UAC R317-6-6.12(A), all samples must be analyzed by a Utah-certified laboratory. Upon approval by DWQ, the Plan will become an enforceable appendix to the permit.

Issue 4: Best Available Technology (BAT) Monitoring Plan

BAT performance monitoring must be done according to a BAT Monitoring Plan approved by the Executive Secretary to insure that the containment technology specified in the Construction Permit is performing as designed. At a minimum, BAT monitoring should include minimum vertical freeboard of ponds, maximum allowable leakage rate through the primary liner, and maximum allowable head for the leak detection sump. These performance standards are based on the precedence of previous ground water discharge permits and *Action Leakage Rates for Leak Detection Systems* (EPA, January 1992). Upon approval by DWQ, the Plan will become an enforceable appendix to the permit.

If you have any questions about this letter or the ground water discharge permit process, please contact me at (801) 536-4358 or mnovak@utah.gov.

Sincerely,

Mark T. Novak

Mark Novak, P.G.
Environmental Scientist
Ground Water Protection Section

MTN:RFH

cc: Rick Havenstrite, Desert Hawk Gold Corporation
Paul Baker, DOGM Minerals Program
Stephen Allen, BLM Salt Lake City Office
Tooele County Health Department

DWQ-2010-005403